CONTACT

If you have technical problems, first contact your installer. The following information is required in order to provide you with the necessary assistance:

- Inverter device type
- Inverter serial number
- Type and number of PV modules connected
- Blink code or display message of the inverter
- Optional equipment (e.g. communication devices)

SMA Solar Technology AG
Sonnenallee 1
34266 Niestetal, Germany
www.SMA.de

SMA Serviceline

Inverters:	+49 561 9522 1499
Communication:	+49 561 9522 2499
Fax:	+49 561 9522 4699
E-Mail:	Serviceline@SMA.de

Installer contact

VISUAL INSPECTION, MAINTENANCE AND CLEANING

Visual Inspection
Check the inverters and the cables for visible external damage. Contact your installer if you find any defects. Do not perform any repair work yourself.

Maintenance and Cleaning
Ask your installer to check for proper inverter operation at regular intervals.

PV Inverter

SUNNY MINI CENTRAL 4600A / 5000A / 6000A

User Manual

SMC46-60A-BEN101210 | IME-SMC50A_60A | Version 1.0

EN

EXPLANATION OF SYMBOLS

Symbols on the Inverter

Operation display.

Ground fault or varistor defective.
Please inform your installer.

An error has occurred. Please inform your installer **immediately**.

Tap to switch on the display light and switch to the next message.

Symbols on the Type Label

Beware of dangerous electrical voltage.
The inverter operates at high voltages. All electrical work on the inverter may be carried out by qualified personnel only.

Beware of hot surface.
The inverter can become hot during operation. Avoid contact during operation.

Observe the enclosed documentation.

The inverter must not be disposed of with the household waste.
Further disposal information can be found in the enclosed installation guide.

CE mark. The inverter complies with the requirements of the applicable EC guidelines.

RAL quality mark for solar products. The inverter complies with the requirements of the German Institute for Quality Assurance and Labeling.

Direct Current (DC)

Alternating Current (AC)

The inverter is protected against penetration by dust particles and water jets from any angle.

The inverter has a transformer.

GLOSSARY

AC
Abbreviation for "alternating current".

Asymmetric load
The difference between the power fed into the grid at the individual phase conductors. In Germany, it is not permitted to exceed a nominal output of 5 kVA. In Italy, the nominal output is limited to 6 kVA.

DC
Abbreviation for "direct current".

Derating
A controlled reduction in performance, usually dependent on component temperatures. Compared with the (also common) practice of completely shutting down the device, the effect on the external grid is smaller with derating.

Electronic Solar Switch (ESS)
The Electronic Solar Switch is part of the inverter's DC disconnection unit. The Electronic Solar Switch must be securely inserted into the bottom of the inverter and may only be removed by qualified personnel.

Grid impedance
The grid impedance is a characteristic grid specification, which is determined both by the grid infrastructure, and by the number of power suppliers and power consumers. If the supply for the grid section should drop due to a grid shutdown of the preceding energy suppliers (medium-voltage transformers), the grid impedance will change abruptly. In order to detect this and to prevent the formation of an unwanted off-grid system, SMA Grid Guard monitors the grid impedance and disconnects the inverter from the grid in the event of a sudden impedance variation.

MPP (Maximum Power Point)
Operational point of the inverter, dependent on current / voltage of the PV generator. The actual position of the MPP changes constantly, depending on the level of solar irradiation and the cell temperature.

PV
Abbreviation for photovoltaics.

SMA Power Balancer
The SMA Power Balancer is a standard feature of the Sunny Mini Central. The SMA Power Balancer prevents the formation of an unwanted asymmetric load > 5 kVA (in Italy > 6 kVA) during three-phase grid feed-in. To this effect, 3 Sunny Mini Centrals are each connected via a control line to a 3-phase feeding unit.

Varistor
The varistors protect the electronics in the inverter from atmospherically coupled energy peaks, such as those that can occur when lightning strikes nearby.

SAFETY PRECAUTIONS

DANGER!

Electric shock caused by high voltage in the inverter.

Even when no external voltage is present, there can still be high voltages in the device. The following work may be carried out by qualified personnel only:

- Electrical installation
- Repairs
- Modification

CAUTION!

Risk of injury from touching the enclosure during operation.
Burns to the body.

- Only touch lid and display during operation.

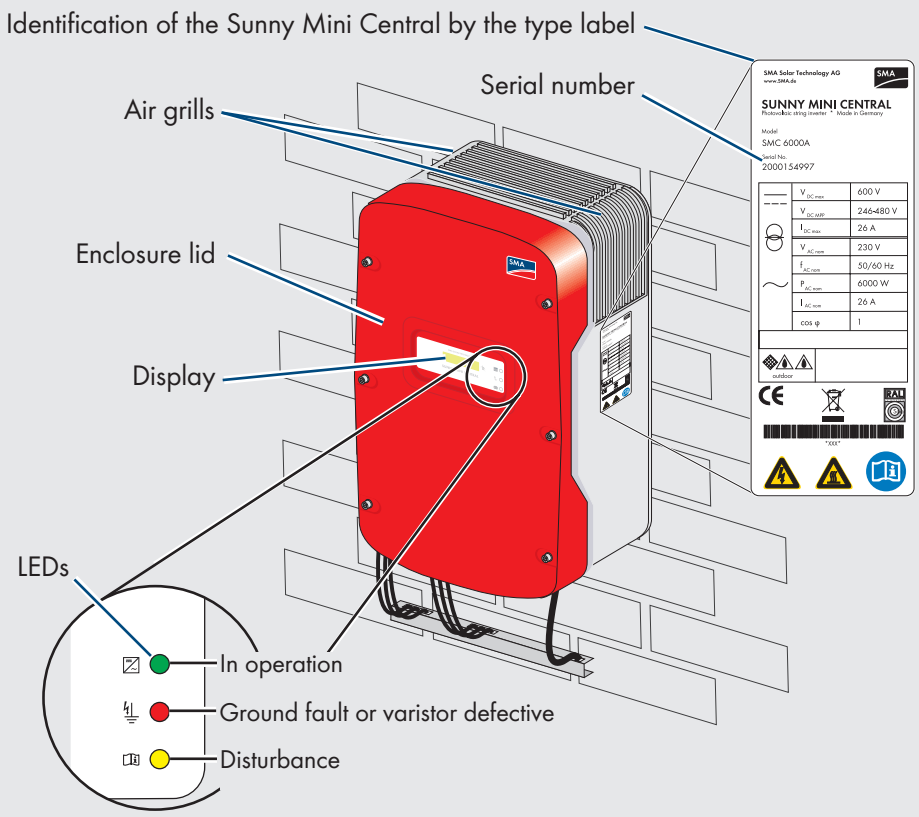
NOTICE!

Overvoltage in the inverter if yellow LED flashes 4 times.
Destruction of the inverter.

- Inform your installer immediately if the yellow LED starts flashing and the following display message appears.

```
!PV-Overvoltage!
!Disconnect DC!
```

PRODUCT OVERVIEW



LED MODES

State	Designation	Function
All LEDs are on	Initialization	The inverter is initializing.
All LEDs are off	Deactivation	The input voltage at the inverter is too low for grid feeding.
Green LED is permanently on	Feeding operation	The inverter is feeding power into the public grid.
Green LED is flashing	Waiting, grid monitoring	The inverter is monitoring the grid and is waiting for the DC voltage to reach a certain level so that it can start feeding the grid.
	Stop	Interruption of operation.
	Derating	Power limitation in the inverter.
Red LED is on	Error	A ground fault has occurred, or one of the thermally monitored varistors on the DC input side is defective. Please inform your installer.
Yellow LED is on continuously	Disturbance	The inverter is operating in "Operation constantly disabled" mode. This can have several causes. Please inform your installer.
Yellow LED is flashing	Disturbance	The inverter is indicating a disturbance. This can have several causes. Please inform your installer.

DISPLAY

Operation

The display shows current values of your system. The displayed values are updated every 5 seconds. The display is operated by tapping on it.

```
903W
360V
```

Tap once
The background illumination is switched on. After 2 minutes, the illumination switches off automatically.

Tap again
The display switches to the next message.

Display messages

In operation

Upon error-free connection of the inverter to the grid, the following notifications are shown in turn after approximately one minute. Each notification appears for five seconds, then the cycle starts again.

```
E-today      0Wh
Mode         MPP
```
Power produced on the current day
Operating condition

```
Pac        903W
Vpv        360V
```
Current feed-in power
Voltage of the PV generator

```
E-total      0Wh
h-total       0h
```
Power produced so far
Total number of operating hours for feeding operations

Disturbance

In the event of a disturbance, the inverter will display the status "Disturbance" and an error message. Please inform your installer. The following notifications will be issued:

```
E-today      0Wh
Mode Disturbance
```
Power produced on the current day
Operating condition "Disturbance"

```
  Disturbance
    Vac-Bfr
```
Operating condition
Error message

```
at:          261V
present:     245V
```
Measured value at time of disturbance
Current measured value (only displayed if a measured value is responsible for the disturbance)

DC overvoltage

```
!PV-Overvoltage!
!Disconnect DC!
```
The DC input voltage connected to the inverter is too high.
Please inform your installer **immediately.**

MEASURING CHANNELS

If your inverter is equipped with a communication component, then numerous measuring channels and messages can be transmitted for diagnosis.

Measuring channel	Description
Balancer	Displays the currently active operating mode of the inverter which is set under the operating parameter "PowerBalancer".
dZac	Grid impedance
Error	Identification of the current disturbance / error.
E-total	Total amount of energy fed into the grid
Event-Cnt	Number of events that have occurred
Fac	Grid frequency
h-On	Total number of operating hours
h-total	Total number of operating hours for feeding operations
Iac	Grid current
Ipv	DC current
Mode	Display of the current operating mode
Pac	Generated AC power
Power On	Total number of grid switch-ons
Riso	Insulation resistance of the PV system to the grid connection
Serial number	Inverter serial number
Vac	Grid voltage
Vpv	PV input voltage
Vpv-Setpoint	PV target voltage

STATUS MESSAGES

Your inverter can be in various operating modes. These are displayed as status messages, which can vary according to the method of communication.

Message	Description
Balanced	The inverter has disconnected itself from the grid, or is limiting its output to 5 kVA over a 10 minute average. The inverter is part of a three-phase system with two further inverters and equipped with the Power Balancer for preventing asymmetric loads.
Derating	Overtemperature in the inverter. The inverter will reduce its output to prevent overheating. To avoid unnecessary output losses, the design of the system should be checked. Please inform your installer.
Disturbance	Disturbance. This message appears for safety reasons and prevents the inverter from connecting to the grid. Please inform your installer.
Error	An error has been detected. Please inform your installer.
grid mon.	Grid monitoring. This display appears during the start phase, before the inverter is connected to the grid, predominantly in the mornings and evenings when the solar irradiation is low and after an error.
MPP	The inverter is operating in MPP mode. MPP is the standard display message when operating under normal irradiation conditions.
Off Grid	The inverter is in "Island" mode. This mode is specially designed for operation in an off-grid system.
offset	Offset adjustment of measurement electronics.
Riso	Measurement of the insulation resistance of the PV system.
Stop	Interruption of operation.
V-Const	Constant voltage operation.
waiting	The switch-on conditions are not (yet) fulfilled.